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# Development of An Educational Program for Registered Nurses on Post Traumatic Stress Disorder

Stephanie Connor

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Development of An Educational Program For Registered Nurses On Post Traumatic  
Stress Disorder

by

Stephanie Ann Connor

A Major Paper Submitted in Partial Fulfillment

of the Requirements for the Degree of

Master of Science in Nursing

in

The School of Nursing

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## **Abstract**

Post-traumatic stress disorder (PTSD) is highly prevalent in the United States, compared to European, Asian, and Latin American countries. Post-traumatic stress can develop through repeated occupational exposure to someone else's trauma, hearing details of other's trauma as well as one's own traumatic events. Nurses are at high risk for developing secondary PTSD due to caring for patients who have suffered life-threatening illnesses or injuries. There is a complex correlation between PTSD and suicide and nurses are also at greater risk of completing suicide versus their non-nursing peers. The Betty Neuman Systems model recommends primary, secondary, and tertiary measures of prevention for health promotion and was used as the theoretical framework to guide this project. There is a paucity of research regarding nurses' knowledge regarding PTSD, therefore the purpose of this project was to determine if there was a change in nurses' knowledge regarding primary and secondary PTSD after an educational intervention. Participants consisted of 18 volunteers from a convenience sample of Registered Nurses at Our Lady of Fatima Hospital. A pre-test, post-test educational design was utilized to assess for an increase in nurses' knowledge. Results indicated there was an overall increase in knowledge by 10.55%. from pre-test to post test; however, a paired t-test was conducted, and the increase was not statistically significant. Literature supports the need to increase the awareness of PTSD in nurses. It can be postulated that there will be an increase in the incidence of PTSD in nurses, post Covid-19. More research is needed to understand resilience factors and preventive treatment. Advance Practice Nurses can focus on prevention and early detection of symptoms, which help alleviate physiological changes and psychological difficulties that may accompany PTSD and mitigate suffering from secondary stress and PTSD.

## **Acknowledgements**

First, I would like to thank my Professor Linda Dame, for her understanding and guidance, as I navigate my education as a technologically challenged, slightly older student, with some untreatable adult attention deficit disorder. I appreciate your direct advice, and your joy in teaching and learning new things.

To my husband Robert Connor RN, I am thankful more than I can say to have your support through everything. You know where I am coming from, since you are also an intensive care nurse and know the grief of taking care of the very sick. You understand, when I come home from a particularly sad shift and just do not feel like talking. Also, thank you for only calling me crazy, when was on my third 12-hour night shift, on about eight hours of sleep out of 72 hours. I also know there are sad cases that still bother you, no matter how many years have passed. This paper is for you. My wish is to find in the research, ways to lessen the secondary stress effects that tend to occur with, either major horrifying events, or with the cumulative effects from the lesser events. Both of which are not good for your overall health and wellbeing.

To all my coworkers, past and present, I am grateful for having all of you in my life. I love our candid discussions. I can honestly say that you are an amazing group of hard-working people who take excellent care of our patients. I hear you being kind to your patients when you are working with them. You give them encouragement in the face of critical illness. You make them laugh, even during the toughest, of sometimes painful, treatments. That, to me, is a real talent.

I also hear the anguish in your voice, when you are wondering how your patient is doing or, when we talk about the worry that we take home with us after a particularly bad

day. These are some of the thoughts, that keep us from getting a good night's rest and recharged to be ready for the next round. Is there something I did wrong? Did I do everything I was supposed to? Is there anything I could have done differently? These are questions I have heard many of us think about aloud. These are all questions that are good to be acknowledged, but is there a way to mindfully think about it honestly, accept it and then get a good night's sleep?

I am thankful to be working with a truly caring group. When I work through the literature, my intention is to focus on information, which is accurate and useful to participants. I hope I can find ways to help ease some of the stress of the tough job we must do and be well enough to go back to. How can we help ourselves and put an extra layer of protection with a boost to resilience? Sometimes people who care for others, forget to care for themselves. Sometimes we need a little reminder to take care and be kinder to ourselves.

Thank you to my children and family. Sometimes it is a struggle, but we can usually find a way to get things done.

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## Development of An Educational Program for Registered Nurses on Post Traumatic Stress Disorder

### **Background/Statement of the Problem**

Posttraumatic stress disorder (PTSD) has possibly existed since the beginning of human-kind and first trauma, but it wasn't recognized as an official diagnosis until 1980 when the American Psychological Association (APA) first added the diagnosis to the *Diagnostic and Statistical Manual of Mental Disorders Third Edition (DSM-3)* (U.S Department of Veterans Affairs, 2019).

In the *Diagnostic and Statistical Manual of Mental Disorders Fifth Edition (DSM-5)* (APA, 2013), the criteria used to diagnose PTSD includes characteristic symptoms which develop after exposure to one or more traumatic events. A traumatic event is defined as "exposure to actual or threatened death, serious injury, or sexual violence" (APA, 2013, p. 271). Posttraumatic stress disorder can develop in someone personally experiencing, witnessing, or learning about a trauma in a close family member or friend. Posttraumatic stress disorder can also develop from repeated occupational exposure to someone else's trauma or hearing the details of trauma (APA, 2013). Post-traumatic stress disorder can develop after any traumatic event that is beyond the individual's stressors and can cause persistent and extreme negative effects on the affected person's quality of life (APA, 2013).

Overall, the United States (US) has a higher incidence of PTSD than European, Asian, African, and Latin American countries. According to the American Psychiatric Association (2013), by age 75, Americans have an 8.7% risk for the development of PTSD, compared to 0.5-1.0% risk in other developed countries. Differences in lifestyle,

learned coping mechanisms, and family relationships may contribute to the presentation of symptoms, quality of life, and the diagnosis of the disorder (APA, 2013).

Secondary trauma is experienced by someone indirectly experiencing a trauma, either through being exposed to a loved one, or through vivid details during work-related indirect exposure (APA 2013). Just as in primary PTSD, secondary PTSD occurs when disturbing symptoms persist. Nurses are at elevated risk of developing secondary PTSD through occupational exposure, due to caring for patients who have suffered severe and/or life-threatening illnesses or injuries (Adriaenssens et al., 2012). Nurses may not be aware of the negative effects on their own health due to exposure to repetitive secondary trauma. Nurses are at risk for secondary distress and PTSD, through the cumulative occupational exposure to traumatic events (Mealer et al., 2017). Hectic work conditions, along with this repeated exposure to traumatic events can lead to post-traumatic stress reactions and affect patient care (Adriaenssens et al., 2012).

According to the U.S. Department of Veterans Affairs National Center for PTSD, there is a complex correlation between PTSD and suicide (U.S Department of Veterans Affairs, 2019). Sareen et al. (2005) conducted a study titled *Anxiety Disorders Associated with Suicidal Ideation and Suicide Attempts in the National Comorbidity Survey and* found that PTSD was the only anxiety disorder that was significantly ( $p > 0.01$ , CI 95%) associated with both suicidal ideation and suicide attempts.

In a profession that centers around caring, nurses are exposed to secondary trauma as they take care of patients and were found to be at greater risk of suicide than their age-matched non-nursing peers (Davidson et. al., 2019). The incidence rate of suicides in female nurses was 11.97 per 100,000 person-years versus 7.58 per 100,000 person-years



in the female general population. The incidence rate of suicides in male nurses was 39.8 per 100,000 person-years compared to 28.2 per 100,000 person-years in the male general population (Davidson et. al., 2019).

Therefore, the purpose of this project was to determine if there is a change in nurses' knowledge regarding primary and secondary PTSD after an educational intervention.

## **Literature Review**

A literature search was performed, using the databases Google Scholar, CINAHL, PubMed, Medline, and MedlinePlus, using the following key words: Post-traumatic stress disorder, PTSD, secondary PTSD, secondary PTSD in nurses, first responder secondary PTSD, critical care PTSD, trauma informed care, secondary PTSD in caregivers, first responder PTSD, PTSD in healthcare workers, preventing PTSD, treating PTSD, altruism in nursing, empathy in nursing, negative consequences of altruism, pathological altruism, CMS PTSD, Substance Abuse and Mental Health Services Administration, Dept of Behavioral Healthcare, Developmental Disabilities and Hospitals (BHDDH) RI, Joint Commission PTSD pdf, resilience scale pdf, medications for PTSD, FDA approved medications for PTSD, pharmacological treatment guidelines for PTSD, non-pharmacological PTSD treatment. Results were limited to peer reviewed articles published in the English language, between years 2010-2020, except for historical data and associated grey literature.

### **Definition and Types of PTSD**

Posttraumatic stress disorder is a mental disorder that can develop in someone after personally experiencing a traumatic event. Diagnosis is based on symptoms which can develop after personally experiencing trauma, witnessing trauma, learning about a traumatic event experienced by a close family member or friend, or by repeated occupational exposure to someone else's trauma (APA, 2013). A traumatic event is defined as exposure to actual or threat of death, serious injury, or sexual violence. To receive a diagnosis of PTSD, an individual must also meet a part of each of eight diagnostic criteria, listed A through H in the DSM-5. Exposure to a qualifying trauma is

considered the first, Criteria A, and must be present for a diagnosis of PTSD (APA, 2013).

PTSD can be considered either primary or secondary PTSD. Primary PTSD occurs after personally experiencing a trauma; secondary PTSD manifests with the same symptoms as primary PTSD but occurs when symptoms develop following exposure to someone else's traumatic event(s). Secondary PTSD can occur after learning of a trauma of a loved one or by learning the details of another individual's trauma, through occupational exposure (APA, 2013).

**Pathophysiology of PTSD.** The pathophysiology of PTSD is not yet fully understood, although there are some physical changes that are known to occur within individuals affected by PTSD. Positron emission tomography has shown alterations, with increased reactivity in the limbic system, which make up the emotional and memory control centers of the brain. The main parts of the limbic system are the hypothalamus, amygdala, hippocampus, and the thalamus. These structures work together to regulate autonomic or endocrine responses to emotional stimuli. Decreased activity in the anterior cingulate and orbitofrontal areas of the brain have been found as well as decreased cortisol and increased norepinephrine levels (Grossman & Porth, 2014).

Klaming et al. (2019) conducted a study to assess the effects of PTSD and early life stressors, on brain structure. The authors based their hypothesis on previous animal studies that showed prolonged or acute stress leads to cell death and decreased neurogenesis in the hippocampus. Klaming et al. wanted to examine if results would be similar in humans. The authors performed Magnetic Resonance Imaging on the brains of 70 male veterans who had all been deployed to a combat area in Iraq. Each of the

veterans had been exposed to a qualifying trauma based on criterion A of the Clinician-Administered PTSD Scale for DSM-5 (CAPS-5) screening tool. The tool is a questionnaire based on the DSM-5 diagnostic criteria. Criterion A of the CAPS-5 are identical to the diagnostic criteria A in the DSM-5 publication. Klaming et al. (2019) performed a shape and volume analysis of the amygdala and hippocampus bilaterally, using magnetic resonance imaging (MRI). The subjects were divided into four groups based on early life stressors (ELS) and PTSD diagnosis as follows; group one ELS yes and PTSD yes, group two ELS yes and PTSD no, group three ELS no PTSD yes and group four ELS no and PTSD no. They did not find significant differences in volumes in the hippocampus or amygdala, but they did find a positive correlation between ELS and shape expansion in the right hippocampus and amygdala ( $p < 0.05$ ) and they also found a positive correlation between severity of PTSD symptoms and right hippocampal shape expansion ( $p < 0.05$ ). With these structural abnormality effects of PTSD symptoms and ELS, the researchers felt that there was correlation but could not determine if the structural abnormalities were from repeated trauma exposure or from developmental abnormalities caused by childhood trauma. Findings indicated the number of PTSD sufferers without ELS was small and they suggested further research with larger samples to fully understand the relationship of risk factors for structural abnormalities in the hippocampus and amygdala and the effect on resilience factors.

**Symptoms and Diagnosis of PTSD.** The clinical features of PTSD will vary from person to person. People affected by PTSD may experience symptoms ranging from mild to extreme. With the updated criteria in the DSM-5, an individual's response, of intense fear, helplessness, or horror to the event, has been removed from the diagnostic

criteria. Key symptoms include distressing memories or dreams, intense distress, flashbacks, avoidance, persistent trauma related negative emotion, feelings of detachment, aggressive or reckless behavior, hyper-vigilance, concentration difficulties, sleep problems, or depersonalization. These symptoms are used for diagnosis of PTSD when they occur for at least one month or more (APA, 2013; Ferri, 2019).

There are currently no lab tests or imaging available to test for PTSD. Diagnosis is based on development of a specific set of symptoms, following a traumatic event. There are four sets of symptom dimensions considered key for diagnosis of PTSD. These include persistent symptoms of intrusion or re-experiencing, avoidance, negative alterations in mood or cognition, and hyperarousal (APA, 2013; Ferri 2019). Diagnosis of PTSD is based on symptoms from all four dimensions in the DSM-5 diagnostic criteria: beginning over the age of one year; usually within three months of a traumatic event; and persist for more than one month.

A trauma-associated, Acute Stress Disorder, can develop, with similar diagnostic criteria, beginning immediately after a trauma and lasting at for least three days and up to one month (APA, 2013). When these symptoms persist beyond the first month, the diagnosis is considered PTSD.

The following table is adapted from the DSM-5 criteria included in each of the four dimensions for diagnostic criteria (APA, 2013).

Table 1.  
Symptoms Used as Diagnostic Criteria for Posttraumatic Stress Disorder

Intrusion symptoms associated with the trauma (1 or more of the following symptoms)	Persistent avoidance of stimuli associated w/ trauma (1 or both of the following)	Negative alterations in cognitions and mood associated with and beginning or worsening after trauma (2 or more of the following)	Marked alterations in arousal and reactivity associated with the trauma (2 or more of the following)
Recurrent, involuntary, and intrusive distressing memories related to (r/t) traumatic event(s)	Avoidance of or efforts to avoid distressing memories, thoughts, or feelings about	Inability to remember an important aspect r/t traumatic event(s), not attributable to head injury, alcohol, or drugs	Irritable behavior and angry outbursts w/ little or no provocation, (e.g., aggression to people or objects verbal or physical)
Recurrent distressing dreams r/t traumatic event(s)	or closely associated w/ traumatic event(s)	Persistent, exaggerated negative beliefs or expectations about oneself, others, or the world	Reckless or self-destructive behavior
Dissociative reactions such as flashbacks where individual feels or acts as though the event(s) is recurring	Avoidance of or efforts to avoid external reminders (people, places, conversations, activities, objects, situations) that arouse distressing memories, thoughts, or feelings about	Persistent, distorted cognitions r/t cause or consequences of the event(s) that lead the individual to blame self or others	Hypervigilance
Intense or prolonged psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event(s)	or associated w/ traumatic event(s)	Persistent negative emotional state (e.g., fear, horror, anger, guilt, or shame)	Exaggerated startle response
Marked physiological reactions to internal or external cues that symbolize or resemble an aspect of the traumatic event(s)		Markedly diminished interest or participation in significant or previously enjoyed activities	Problems w/ concentration
		Feelings of detachment or estrangement from others	Sleep disturbance, such as difficulty falling or staying asleep or restless sleep
		Persistent inability to experience positive emotions	

Adapted from (APA, 2013, p.271-272)

The Primary Care PTSD Screening Tool is one of several recommended instruments for screening for PTSD (Prins et al., 2015). It is a clinician administered, five-question screening tool. It begins with screening for a history of trauma and then follows with asking five yes or no questions: had nightmares about the event(s) or thought about the event(s) when you did not want to; tried hard not to think about the event(s) or went out of your way to avoid situations that reminded you of the event(s); been constantly on guard, watchful, or easily startled; felt numb or detached from people, activities, or your surroundings; and felt guilty or unable to stop blaming yourself or others for the event(s) or any problems the event(s) may have caused? A score of three to five yes answers correlates to probable PTSD. The instrument was tested for reliability and sensitivity in a convenience sample of 398 veterans with the Primary Care PTSD screen compared to results from a brief psychiatric interview with a 95% confidence interval (Prins et al., 2015).

**Suicide in PTSD.** PTSD is associated with an increased risk for suicidal ideation (Davidson et al., 2019 Ferri, 2019). According to the Centers for Disease Control's most recent information on suicide rates by Industry and Occupation, Registered Nurses have a higher suicide rate at 10.1 per 100,00 than compared to the general population, all-occupation group rate of 7.7 per 100,000, with a confidence interval of 95% (Peterson et al., 2020).

Davidson et al. (2018) published a discussion paper for the National Academy of Medicine to raise awareness about nurse suicide. The authors reached out to the medical community and stressed the need for further research, including ways to mitigate secondary stress and burnout (Davidson et al., 2018). The authors were trying to raise

awareness about nurse suicide following the suicide death of a coworker and conducted a literature review. Davidson et al. (2018) wanted to break past the boundaries of stigma related to nurse suicide, mental health, and treatment. In their search they found multiple studies regarding factors that increase the incidence of work related to anxiety, compassion fatigue, depression, ethical issues, second victim or secondary PTSD. They found that burnout could lead to poor work performance and safety issues, leading to depression which is a known precursor to suicide (Davidson et al., 2018). These work stressors combined with stress from home were found to increase suicide risk among nurses. The authors postulated that nurses may hold themselves to a higher standard or feel ashamed of their own issues with mental health and that being trained to help others, they were less likely to take care of their own issues with mental health (Davidson et al., 2018). The authors turned their focus to literature on nurses' suicide, which they considered an irreversible, silent scourge. With this literature review, Davidson et al. (2018) found that nurse suicide had not been adequately measured or studied but that the prevalence of depression among nurses reported between 18-41%.

During the next year, Davidson et al. (2019) conducted a study, following the suicide death of their coworker. The University of California researchers looked at the Centers for Disease Control and Prevention Department for the National Violent Death Reporting System and found that both female and male nurses were found to have a significantly higher risk ( $p < 0.001$ ), for completing suicide than their non-nursing age matched peers. While Davidson et. al. found that nurses are more likely to use pharmaceuticals to commit suicide, where the general population is more likely to use firearms, they did not explore the reasons for the difference. The authors reported the



most common drugs used for suicide were benzodiazepines and opioids. From these results, Davidson et al. concluded that there is an urgent need for future studies in the development of preventative strategies for nurses (Davidson et al., 2019).

**Risk factors for the development of PTSD.** Not everyone will develop PTSD but there are known risk factors for the development of PTSD following a traumatic event. Risk factors include: a previous history of trauma; childhood abuse or neglect; a lack of social support; severity of psychological distress after an event; and female gender. Women are twice as likely than men to suffer from PTSD (Ferri, 2019). The nature of the trauma, personality traits, individual differences in vulnerability, and resilience were also found to be important risk factors for development of PTSD (Skogstad et al., 2013). Psychological distress is more likely to produce trauma, with interpersonal violence increasing the risk more so than accidents or natural disasters (Ferri, 2019).

There is evidence of an association of metabolic disorders in people with PTSD. Talbot et al. (2015) studied 44 participants with PTSD and 50 participants without previous psychiatric diagnoses and investigated the relationship between PTSD and metabolic risk factors, along with sleep habits and the development of symptoms in medically healthy adults. Participants were between the ages of 20 and 50 years old. The authors found participants with PTSD had a shorter average sleep duration based on participants self-reported sleep diary. Controlling for overall body fat percentage, the PTSD group had higher metabolic risks than the control group, as measured by their increased triglycerides ( $P=.03$ ), total cholesterol ( $p<0.001$ ), low density lipoprotein (LDL) cholesterol ( $p=0.006$ ), very low-density lipoprotein (VLDL) cholesterol

( $p=0.002$ ), cholesterol to HDL ratio ( $p=0.024$ ). No differences were found in truncal fat or levels of high-density lipoprotein (HDL) cholesterol. Both groups that had higher truncal fat levels were associated with lower sleep duration. In the PTSD group, Talbot et al. found lower sleep duration was negatively correlated with triglyceride levels and VLDL cholesterol. Overall, the PTSD group had a worse metabolic profile than the control group. The researchers found this information more significant in the fact that participants in both groups were relatively young and lacked any significant co-morbidities (Talbot et al., 2015).

**Gender Considerations.** Females are at higher risk for PTSD than men, but females may be more responsive to treatment (Ferri et al. 2019). Pacella et al. (2014) conducted a randomized control trial, “The Impact of PTSD Treatment on the Cortisol Awakening Response”. The researchers compared 30, 45, and 60-minute post-waking cortisol saliva samples both before and after treatment. Participants were randomly assigned to prolonged exposure therapy, in which participants were asked to recount the story of trauma again and again until it became routine and ideally no longer traumatic, versus pharmacotherapy, in which patients were prescribed the selective serotonin reuptake inhibitor, sertraline, by a board-certified psychiatrist. Participants included a convenience sample of twenty-nine volunteers who were part of a larger clinical trial of individuals with chronic PTSD. Inclusion criteria consisted of adults between 18 and 65 years of age and DSM-IV primary diagnosis of PTSD. Exclusion criteria consisted of a current diagnosis of schizophrenia or delusional disorder, medically unstable bipolar disorder, depression with psychotic features, or depression severe enough to require immediate psychiatric treatment, self-injurious behavior or suicide attempt within three

months, no clear trauma memory or the trauma occurred before the age of three, current diagnosis of alcohol or substance dependence within the previous three months, ongoing relationship with the perpetrator, unwilling or unable to stop current Cognitive Behavioral Therapy training or antidepressant medication based on condition assignment, previous nonresponse to adequate trial of either prolonged exposure therapy (eight weeks) or sertraline therapy of 150 mg per day for eight weeks, or any other medical contraindication to the use of sertraline (Pacella et al., 2014). The participants were divided into two groups, either prolonged exposure or a sertraline group. Pacella et al. disclosed that there were 21 females and 8 males randomly assigned to the two groups. One of the authors' hypotheses was that there would be a difference in cortisol awakening response between males and females in "responders" vs "non-responders" (to treatment). Responders to treatment were those that reported a decrease in symptoms based on a standardized PTSD Symptom Scale-Interview (PSS-1). Pacella et al. stated in their introduction that they were building upon previous research that did not account for diurnal variations in cortisol levels and/or did not include both males and females. The authors predicted a difference but did not state a specific direction regarding the difference. Testing the 30, 45, and 60-minute post-awakening saliva levels was intended to eliminate the differences found in the natural diurnal cycle (Pacella et al., 2014).

Pacella et al. (2014) found no significant difference between the prolonged exposure and the sertraline group ( $p = .70$ ). The authors' results did reveal that the cortisol reactivity of female treatment non-responders was higher than that of female treatment responders but that there were no differences in the men's groups. Treatment response varied by gender ( $\chi^2 [1, N = 29] = 5.78, p = .02$ ). Women were more likely to

respond to PTSD treatment (90.48%) compared to males (50%). Treatment response was measured by comparing participants' PTSD Symptom Scale-Interview (PSS-I) score to after completion of treatment PSS-I score. Females and PTSD treatment responders, overall, displayed higher cortisol reactivity than males and treatment non-responders at baseline (Pacella et al., 2014).

The authors used this information to discuss future research on whether females may have greater room for improvement with therapy and could result in a reduction in psychological and physiological symptoms with successful therapy. The authors discussed the small sample size, the need for caution when interpreting results from their study, and recommended a longer follow-up time (Pacella et al., 2014).

#### **Evidence Based Treatments: Pharmacological and non-pharmacological treatments.**

**Pharmacological Treatments for PTSD.** Ipser and Stein (2012) performed a meta-analysis of 37 quantitative, placebo-controlled, random control trials for adults diagnosed with PTSD. The researchers asked four focused questions: Is medication effective in treating PTSD; are some agents more effective than others (mainly monoamine oxidase inhibitors (MAOIs), selective serotonin reuptake inhibitors (SSRI's), tricyclic antidepressants (TCA's), anticonvulsants to treat limbic hypersensitization/increased arousal symptoms, antipsychotics, and benzodiazepines; how long should medications be administered; and are augmentation strategies effective in treating resistant PTSD (Ipser & Stein, 2012).

To analyze whether medications were effective, the researchers' looked through each trial's response criteria and considered whether they had significant differences in symptom severity. Ipser and Stein (2012) found there were inconsistencies in the

evidence but pointed out the differences in study methodology that could account for this. Overall, the researchers reported the strongest evidence of efficacy was with the use of SSRI's. This class of medications was found to be fast acting, with responses documented at two to four weeks of therapy, and to be non-dose-dependent therefore, could be started on recommended low dose ranges with minimal side effects (Ipser & Stein, 2012).

There are currently only two United States Food and Drug Administration (FDA) approved medications used to treat PTSD. They are SSRIs, and are sertraline (Zoloft), and paroxetine (Paxil) (Woo & Robinson, 2016). The SSRIs work by blocking the transport mechanism that returns unbound neurotransmitter, 5-hydroxytryptamine (5HT), also called serotonin, left in the synaptic cleft into the presynaptic neuron, leaving more 5HT available to bind with postsynaptic serotonin receptors (Woo and Robinson 2016). Other medications prescribed for PTSD are considered off-label. Medications that are prescribed for PTSD work on the serotonin (5HT), norepinephrine (NE), gamma-aminobutyric acid (GABA) and dopamine (DA) neurotransmitters, which act on the fear and anxiety areas of the brain (Baron & Lee, 2013; Woo & Robinson, 2016).

SSRI's may cause several side effects including sexual dysfunction in the form of decreased libido and difficulty with orgasm, gastrointestinal upset, loss of appetite, weight loss, and tremors. Taking SSRI's and monoamine oxidase inhibitors (MAOI's) together or taking a SSRI within 14 days of taking a MOAI is contraindicated and may lead to serotonin syndrome caused by excessive serotonergic activity. Serotonin syndrome causes changes in mental status, nausea, diarrhea, muscle stiffness or jerking, autonomic instability including heart rate and blood pressure dysregulation, sweating,

agitation, and hyperthermia. Untreated, this can escalate to a crisis leading to coma or death (Baron & Lee, 2013; Woo & Robinson, 2016).

Caution is advised for anyone beginning any SSRI. During the first three weeks of beginning an SSRI and before therapeutic levels have been achieved, there is an increased risk of suicide due to an increase in neurocognitive activity. Withdrawal is a concern for all SSRI's, with the exception of fluoxetine. Symptoms of withdrawal can occur after missing just one dose causing nausea, dizziness, tingling or prickling or electrical shock sensations or visual floaters (Woo & Robinson, 2016).

Prescribing recommendations include strict dose adherence, not exceeding maximum dose, adhering to a schedule, avoid stopping abruptly, and not prescribing more than one SSRI. When switching from one SSRI to another, it is recommended that the current medication be tapered for a minimum of five days and at half the dose before starting another serotonergic medication (Baron & Lee, 2013; Woo & Robinson, 2016). In addition, the lowest effective dose should be used when prescribed to pregnant women. Higher doses have been associated with fetal malformations in animal testing. Risk to benefit ratio should always be considered. When used in the third trimester of pregnancy, there is increased risk of breathing and feeding complications in newborns, who have had prenatal exposure. Before pregnancy categories for medications began to be phased out in 2015, in favor of medication specific reproductive information, most SSRIs were considered pregnancy category B (Woo and Robinson, 2016). Therefore, most SSRIs are considered safe in pregnancy, except for Paroxetine, which is considered pregnancy category D, and unsafe to use (Woo & Robinson, 2016).

**Non-Pharmacological Treatments for PTSD.** Some alternate, or adjunct therapies to medications to treat PTSD include neurofeedback therapy, Eye Movement Desensitization and Reprocessing (EMDR) Exposure Therapy, Cognitive Behavioral Therapy (CBT), and Transcranial Magnetic Stimulation (Taylor et al., 2003, Ferri, 2019).

Neurofeedback therapy is used to teach a patient self-regulation with the use of an EEG while participating in brain training exercises (Taylor et al., 2003, Ferri, 2019).

Eye Movement Desensitization and Reprocessing Therapy is used to help alleviate symptoms by having the patient recall distressing images from trauma while receiving bilateral sensory input such as tapping or using side to side eye movements. With Exposure Therapy, a patient repeats the details of the trauma until the trauma does not affect them as much. Relaxation training consists of becoming aware of tension within the body. In a study by Taylor et al. (2003), relaxation training consisted of recording of scripted psychotherapist-guided relaxation exercises that patients would implement to help relieve symptoms during periods of anxiety.

Taylor et al. (2003) conducted a randomized control trial, “Comparative Efficacy, Speed and Adverse Effects of Three PTSD Treatments: Exposure Therapy, EMDR, and Relaxation Training”. Participants were randomly assigned to the three different treatment groups. For each treatment, eight 90-minute individual sessions over eight weeks were scheduled. The study included 60 out of a possible 299 adult volunteers, who met the inclusion criteria. Inclusion criteria included: the ability to sign informed consent, a diagnosis of PTSD as their primary problem, and those willing to suspend other psychological non-pharmacological treatments and keeping any pharmacological treatments constant for the full length of the study. Primary outcome measures were the

assessment of the four PTSD dimensions and the rating of whether the participants met the DSM-IV-TR criteria for PTSD diagnosis after treatment. A clinician administered the PTSD subscale CAPS tool and administered as pre-test, post-test comparison before and after the selected treatment (Taylor et al., 2003).

Only 45 of the participants completed all sessions and the post-test. Results showed all three treatments improved symptoms even if the patients were not completely free of symptoms. Exposure therapy had the largest percentage of people no longer meeting PTSD diagnosis standards after treatment. This group also had the most dramatic decreases in symptoms of re-experiencing, numbing, avoidance, and hyperarousal. Approximately 80% of the exposure therapy participants had sustained results of not meeting diagnostic criteria for PTSD at a one-month post treatment follow-up. Fifty percent of the Eye Movement Desensitization and Reprocessing therapy participants were no longer meeting diagnostic criteria for PTSD. Relaxation techniques had lesser results in all areas, but 30% were not meeting diagnostic criteria at their one-month post treatment follow-up. To assess for a clinically significant change, the researchers used a clinician assessed PTSD questionnaire and looked for a reduction in scores by at least two standard deviations in each of the four PTSD dimensions of re-experiencing, avoidance, numbing, and hyperarousal. The Exposure therapy had the highest percentage of clinically significant change. All therapies showed improvement, but measures compared exposure therapy vs EMDR vs relaxation therapy showed the largest difference. Exposure therapy was superior to relaxation therapy in three of the four dimensions, with re-experiencing ( $p < .03$ ), avoidance ( $p < .01$ ), and hyperarousal ( $p < .01$ ) (Taylor et al., 2003).



Trauma Informed Care (TIC) is an approach to behavioral health care that is intended to lower the risk of re-traumatizing an individual through institutional or healthcare practices (U.S. Department of Health and Human Services, 2015). Hall et al. (2016) conducted a pilot mixed-methods study and introduced the framework of Trauma Informed Care in an education package to nurses in two separate emergency departments. The authors' intention was to incorporate TIC into routine practices in the ED. They chose one urban and one rural hospital, both of which accepted pediatric and adult patients and had the ability to admit patients to inpatient psychiatric services. The authors conducted exploratory research and developed eight learning modules for all of the ED nurses: An introduction to TIC; neurobiological impacts of trauma; social consequences of trauma; cognitive model of trauma; "self-fulfilling prophecy (how care delivery affects the trauma- past, current, future); response to patient stories, trauma and the workforce (stress on mental health professionals, strategies to improve self-care); and a section for discussing the training and how to begin implementing the knowledge in the workforce; and what changes could be made in their departments in order to be able achieve immediate results. All the modules were taught in one day. Data was collected through a pre-test/ post-test design using a 5-point Likert scale with 1 = "strong disagreement" and 5 = "strong agreement". Data was also collected three months after the original module teaching through 40-minute focus group interviews, where staff perceptions of experiences regarding the benefits of TIC, were discussed. There were 13 discussion questions that focused on including "what changes have you made in your everyday work since the TIC education" and "how have you applied what you have learned into your practice, with concrete examples" (Hall et al., 2016). A convenience sample of 34 ED

nurses completed the modules. Results indicated the nurses reported an increase in confidence with talking to patients about traumatic experiences, responding to disclosures of family violence, and a better understanding of how their current nursing practice is trauma informed. The findings also indicated that there were no changes in the ED nurses' understanding of their role to listen to patients talk about their trauma or feeling confident about how to respond to patients' disclosure about trauma (Hall et al., 2016). Fourteen of the nurses from the original groups participated in the group discussions. Using the concept of phenomenology and theme analysis with an inductive approach, the researchers found that the nurses did report an improvement of the general understanding of trauma informed care, that some participants reported changes in their own attitude toward trauma patients' behavior and others who did not necessarily feel their attitudes changed, did at least feel they could understand better where these challenging behaviors were coming from. Some of the limitations the authors found were the environmental complexities and pressures of the ED, making it difficult to take the time away from day-to-day ED work requirements to participate (Hall et al., 2016).

**Secondary PTSD in healthcare workers.** One of the ways secondary PTSD can occur is through occupational exposure (APA, 2013). Occupations where workers have a higher incidence of exposure to trauma through public service, such as police officers, firefighters, ambulance personnel, and healthcare workers are at an increased risk due to the nature of their profession (Skogstad et al., 2013).

Skogstad et al. (2013) performed a meta-analysis to study available literature regarding occupational groups at increased risk of occupation-related PTSD. The authors performed a multi-database search for literature published between 1967 and 2010. The

authors searched for peer reviewed articles in both English and Scandinavian, and after excluding research that was irrelevant to occupational PTSD, and groups with non-direct traumatic exposure, were left with 140 eligible articles (Skogstad et al., 2013).

Skogstad et al. (2013) prioritized what they considered highest scientific quality in their article choices, including longitudinal studies, systematic reviews, and cross-sectional studies with more than 100 participants, but also included some clinical studies with at least ten participants and divided groups by profession. Police officers, firefighters, ambulance personnel and healthcare personnel, nurses, and doctors were divided in groups.

Police officers were expected to have the highest anticipated risk of exposure to witnessing other people's suffering and death and potential life-threatening and/or traumatic events. Though their exposure risk was higher, prevalence of PTSD in police officers has been reported at less than 10%, much lower compared to a 20% prevalence in the firefighter group. These numbers are both still greater than the 8.7% risk Americans have for the development of PTSD (American Psychiatric Association, 2013).

Possible reasons noted for the low numbers in police officers are underreporting due to occupational culture and difficulty in admitting the need for help for fear that is a sign of weakness. Police officers may be under increased pressure to control emotions, but those who did report PTSD symptoms after three months following a traumatic event, reported problems with introversion, difficulty with expressing feelings, and lack of time off, or support from their organization (Skogstad et al., 2013). Firefighters and ambulance personnel were both found to have a prevalence of PTSD around 20%. Staff support was reported to be helpful in mitigating PTSD in some studies (Skogstad et al., 2013). The

researchers found that exposure to repeated trauma was associated with symptoms of hyper-arousal, job dissatisfaction, negative thoughts about work, lack of interest in hobbies and social support, especially in those who felt they were not given sufficient support from their employers (Skogstad et al., 2013).

**Secondary PTSD in Nurses.** There is a paucity of research regarding knowledge regarding PTSD in nurses. Skogstad et al. (2013) found among healthcare workers, nurses in intensive care units and those working in mental health are at highest risk for developing PTSD. Nurses working in these areas have repetitive exposures to suffering, death, and physical assaults, therefore increasing the risk of PTSD.

Nurses might not associate their symptoms with PTSD, if their symptoms are related to repetitive stress events, where there was no major crisis or large-scale event. Being exposed to multiple smaller events may also increase the risk for PTSD following a major event (Adriaenssens et al., 2012). A survey of Emergency Department nurses revealed that PTSD symptoms experienced after large scale events were similar to symptoms experienced after repetitive smaller events (Adriaenssens et. al., 2012).

One area that deserves further study is examining what it is about the environment of an ICU that may be a contributing factor in the development of PTSD. It is estimated that there are approximately five million admissions to ICUs in the US each year, and an average of over 200,000 of those patients die during their admission. That leaves approximately 4,800,000 survivors of ICU related hospital admissions. Almost a quarter of ICU patients who survive the ICU admission suffer from stay-related PTSD symptoms (John Hopkins Medicine, 2015). The study excluded ICU patients with stays related to an actual physical or emotional trauma. Those estimates add up to approximately 1.2 million

ICU-survivors who will leave the hospital, suffering from PTSD related to their ICU stay alone. There is potential for occupational exposure in the nurses taking care of any of these patients.

**Strategies to improve resilience.** Not everyone will develop PTSD after a traumatic event and what is traumatizing to one person may not be to another, but there is potential for developing symptoms. Whether someone's symptoms persist beyond one month and develop into post-traumatic stress disorder can be affected by an individual's current state of health and available coping mechanisms (U.S Department of Veterans Affairs, 2019). The individual's state of health and available coping mechanisms make up their primary lines of resistance to stress, as described by the Betty Neuman Systems model (Neuman, 2005). This would suggest that strategies to improve health and decrease controllable factors in metabolic syndromes as previously discussed will help strengthen the lines of resistance and improve resilience.

Carmassi et al. (2020) defined resilience as being able to react to stress in a healthy way when goals are met with minimal cost to one's physical and psychological well-being. The authors performed a systematic review with the intention to investigate healthcare workers (HCW) working during three major coronavirus outbreaks, including Covid-19. They were seeking to identify potential risk factors and resilience factors for developing PTSD. Amongst the major risk-factors they found were, working in emergency departments, having a disrupted circadian rhythm due to night-shift work, HCW who had to quarantine, psychiatric history, less experience, having a higher level of exposure to infected patients, perceived threat to their own personal health and safety, or having poor coping mechanisms to stress, such as avoidance, hostility, and self-blame.

The authors also found having young children, being married or being female, although one study did find male technicians with less than two years of experience were at higher risk. They had a higher rate of considering resignation or not wanting to go to work (Carmassi et al., 2020).

Modifiable resilience factors they found, were having support from either family, friends, supervisors, co-workers, or organizations, using positive coping mechanisms such as humor, venting, acceptance, planning and altruistic acceptance of work-related risks. Having proper training, with clear guidelines and having the motivation to learn were also helpful in lowering the risk of PTSD (Carmassi et al., 2020).

One program to increase resilience is the *Ornish Program for Reversing Heart Disease*, which has been gaining recognition in its applicability in non-cardiac applications (Haber, 2016). With practice, the program has been shown to improve neuroplasticity in the hippocampus and amygdala (Ornish & Ornish, 2019), the areas of the brain, which are known to be affected in PTSD. In addition to being a Medicare covered program for reversing heart disease, this lifestyle intervention program is being utilized in research on Alzheimer's, cancer, stress reduction, diabetes, and pre-diabetes (Preventive Medicine Research Institute, 2020).

The program approach is similar to the Neuman Systems Model as a multifaceted approach of better eating, nurturing relationships, and emotional support, exercising and reducing stress. In particular, stress management can be enhanced by changing perception or one's view of stress, as enhancing or helpful in growth instead of being viewed as harmful to the self (Ornish & Ornish, 2019).

There are five stress reduction techniques recommended in this program; gentle stretching to relax the body and focus inward on the conscious experience of being in your own body, breathing techniques to increase oxygen circulation and decrease blood pressure, meditation practices to improve concentration and obtain a more consistent feeling of calm, clarity and focus, guided imagery to help the body re-pattern feelings thoughts and physical states that reduce worry and stress and deep relaxation techniques to retrain the body to let go of tension and stress and improve sleep (Ornish & Ornish, 2019).

**Resources for nurses.** The American Nurses Association website is currently promoting a Well-Being Initiative (American Nurses Association, 2020a) and providing free access to nurses, with tools and apps which are intended to support the mental health and resilience of nurses. One of the apps, the Happy App, provides access to two free calls to a 24-hour call center for nurses to talk confidentially about the topics of self-care, wellness, recovery, and resilience. The program provides access to a five-week guided writing program to help nurses initiate narrative expressive writing. There is also a stress self-assessment scale, with multiple resources for mental health, sleep improvement, and well-being (American Nurses Association, 2020b). In addition, some employers offer benefits through employee assistance programs, such as through UNUM. They offer various services for health promotion, emotional well-being and personal development and can help match needs to resources. The UNUM group offers webinars on mindfulness, stress reduction, and resilience, and has resources to help with work-life balance (UNUM Group, 2020).

### **Theoretical Framework**

The theoretical framework that was used to guide this major project is the Betty Neuman Systems Model. The Betty Neuman Systems Theoretical Model is a grand nursing theory or conceptual framework. It was first developed by Betty Neuman RN, FAAN, PhD in 1970 as a concept model for nursing education and practice. The model is complex and is best explained while looking at a picture model of the theory (Appendix A). The theory explains a client system's relationship with stress and reaction to stress in the context of the physiological, psychological, sociocultural, developmental, and spiritual dimensions of the whole person. The word system may be defined loosely as one individual, a family, group, or population with something in common. The physiological, psychological, sociocultural, developmental, and spiritual dimensions are all influenced by and will also influence a system's intra-personal, inter-personal, and extra-personal response to stressors (Neuman, 2005). Like the systems model, PTSD treatment should attempt to address the five interacting variables of the whole person. Why one person experiences a trauma and later develops post-traumatic stress disorder symptoms and another person who experiences a similar trauma is somehow able adapt and move on, is a complex one.

As Neuman explains, the system or person possesses three levels of resistance to any stressor capable of disrupting the equilibrium of the system. The three levels of resistance in Neuman's model, are interrelated and complex, and are illustrated with smaller circles within larger circles. These circles represent the various levels of defense a person has for use in defense against stressors. The innermost circle consists of the system's strength or basic structure and energy resources that make up the physical being and includes genetics, nutrition, and overall health at the center of the model. For the



purpose of this project, the system is considered to be the individual nurse. The core is surrounded by the lines of resistance and defense. These are a person's available protective mechanisms they have either created or has inherent within them to stabilize and maintain the usual state of wellness (Neuman, 2005).

The Neuman model also emphasizes prevention as an intervention for health promotion. The model divides the concept of prevention into three levels, primary, secondary, and tertiary, against instability of the system. (McEwen & Wills, 2014). Perhaps one day we will be able to screen people for genetic risk factors, which may increase someone's likelihood of developing PTSD. For now, we must approach primary prevention of PTSD by being proactive, with early recognition of symptoms, and prompt treatment of secondary stress, before it leads to PTSD. Each of the three types of prevention requires knowledge regarding symptom recognition. Primary prevention is primarily aimed at reducing risk or addressing risk before a stressor occurs so that either the stressor is avoided or has a reduced impact on the system (McEwen & Wills, 2014). Strengthening the lines of resistance through optimizing the health of the system or individual would be emphasized. Secondary prevention is aimed at minimizing and treating symptoms after the stressor has occurred. Tertiary prevention is aimed at learning to cope, adapt, and return to wellness or return to the best possible new baseline after the symptoms have occurred (Neuman, 2005).

## Method

**Model used to guide the overall project.** The W.K. Kellogg Foundation Logic Model Development Guide was used to guide development of the educational program for nurses. It is a guide to using the logic model theory of change to help drive a program while keeping activities in line with the desired outcomes. The Logic Model is intended to help simplify a project while also keeping a record of those activities. This record can also aid in future projects by being able to see what was done previously. It is also intended to help organize materials into targeted, pertinent information that can be taught in a very short session in a busy setting (Hayes et al., 2011). The logic model is used as a guide to keep track of resources, activities, and outputs while also focusing on short and long-term outcomes (Appendix B).

**Research Question.** Will there be an increase in nurses' knowledge regarding primary and secondary PTSD after an educational intervention?

**Purpose.** The purpose of this project was to determine if there was a change in nurses' knowledge regarding primary and secondary PTSD after an educational intervention.

**Design.** A pre-test, post-test educational design was utilized to assess for an increase in nurses' knowledge.

**Sample.** The participants consisted of 18 volunteers from a convenience sample of all Registered Nurses working at Our Lady of Fatima Hospital who were included in the CharterCare nursing email group.

**Site.** The site was Our Lady of Fatima hospital (CharterCare system hospital), a community, for-profit, non-teaching hospital located in North Providence, RI. The

hospital has 579 licensed beds, which include a 30-bed emergency department, a 15-bed intensive care unit and a 30-bed psychiatric/ behavioral health-medical unit.

**Procedures.** Permission to conduct this project was received from Chief Nursing Officer, Lynn Leahey at Our Lady of Fatima Hospital. Support was also obtained from Patricia Bibeault, nurse manager who manages multiple units (Appendix C). Exempt status was granted from CharterCare (RWH) IRB (Appendix D) and approval was obtained from the Institutional Review Board at Rhode Island College (Appendix E).

Once permission was obtained a recorded PowerPoint presentation was created to ensure continuity in the education for each participant. The presentation included information aimed at increasing knowledge of primary PTSD and secondary PTSD in staff nurses, and strategies to help prevent PTSD following a traumatic event. The recorded PowerPoint was uploaded into the HealthStream online education portal, for registered nurses at Fatima Hospital. The HealthStream system is available to all nurses through a secure online application. The pretest and post-test were included electronically, with the presentation.

An email with an informational letter (Appendix F), explaining the project, was sent to registered nurses, through their CharterCare email. A reminder email was sent out to potential participants at 2 weeks and again at 4 weeks due to a low number of responses. The informational letter in the email contained a link to the educational PowerPoint and tests and stated participation in the educational program was completely voluntary. Completion of the pre and post-tests was considered consent to participate in the project and participants were informed they may withdraw from the project at any time.

The electronic pre-test was taken immediately prior to the educational program. The educational intervention was limited to 15 minutes. The electronic pre-test was taken immediately before and the post-test was taken immediately following the educational intervention.

The only demographic data collected was years of experience as a registered nurse. Results were stored in the secure HealthStream database and data was made accessible, with the assistance of Robert Cole RN, in the education department. Reports with the scores for each question were generated as anonymous test scores.

**Ethical Considerations.** There was the potential for the program to trigger strong emotions or symptoms. For this reason, resource information from the Employee Assistance Program at [www.unum.com/lifebalance](http://www.unum.com/lifebalance) (UNUM Group, 2020), National Well-being Initiative for Nurses (ANA, 2020a) and the National Suicide Prevention Lifeline at [suicidepreventionlifeline.org](http://suicidepreventionlifeline.org) or 1-800-273-TALK (8255) (Federal Substance Abuse and Mental Health Services Administration, 2020) was made available in the PowerPoint presentation.

**Measurement.** Nurses' knowledge of PTSD was measured using a pre-post test. The pre-post test consisted of 10 true/false questions regarding primary and secondary PTSD. The test was developed by this author and includes important points from the literature review (Appendix G). It was reviewed by the nurse educator at the hospital and HealthStream administrator, Robert Cole RN.

**Evaluation/ Assessment.** The expected outcome of the intervention was an increase in knowledge of PTSD. To measure knowledge, pre-test and post-test were compared and analyzed. Overall pre-tests mean scores were compared to overall post-test

mean scores to determine if there was an increase in knowledge. Individual question scores were evaluated to identify areas of knowledge deficits.

Pre-test mean scores were compared to post-test mean scores. A simple T test was performed. The null hypothesis was that there was no significant increase from pre-test to post-test aggregate scores and the two-sample means are equal. The alternate, expected hypothesis was that there was an increase in mean scores from pretest to post-test.

## Results

The sample of participants who completed the pre-test and post-test consisted of 18 Registered Nurses (RNs). The majority of participants had more than 20 years of nursing experience (nine participants, 50%). Two participants had 16-20 years, four had 11-15 years, two had 6-10 years, and one had 0-5 years of experience as an RN (Table 2).

Table 2. Demographics

Year experience as RN	N=18
0-5 years	1
6-10 years	2
11-15 years	4
16-20 years	2
>20 years	9

The results of pre and post test scores received from the HealthStream database did not match scores to individual participants, so it was impossible to identify any trends based on years of experience as an RN.

Results were analyzed and compared the 18 participants pre and post-test scores for each question. Results are displayed in the bar graph below (Figure 1).

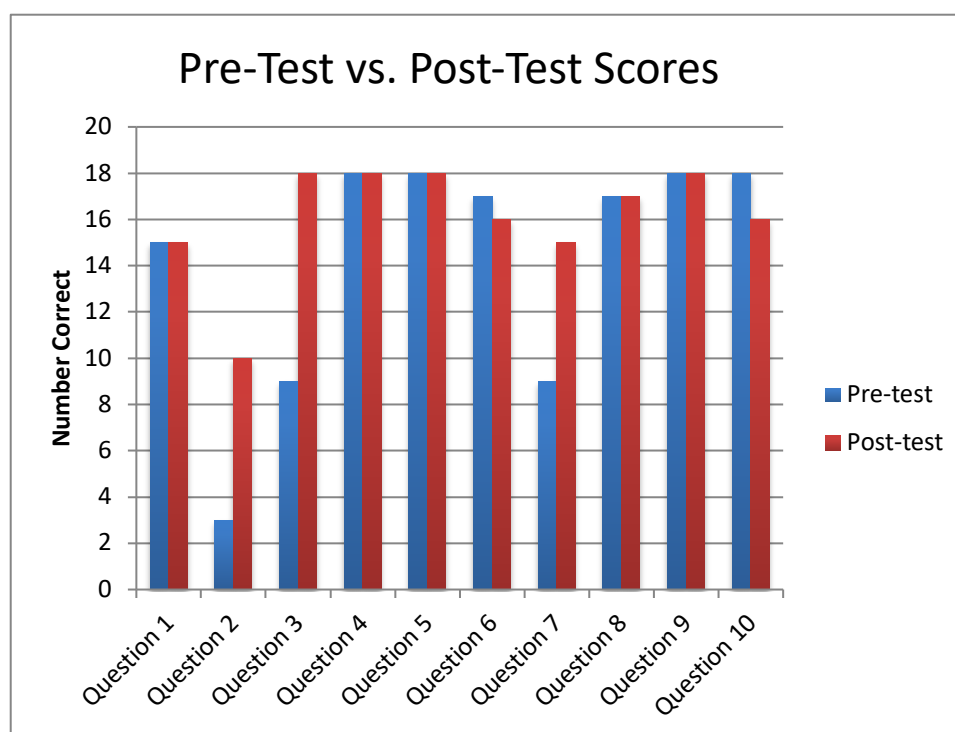


Figure 1.

A breakdown of the scores can be found in Appendix H. There was no change in scores on questions 1, 4, 5, 8, and 9 from pre to post-test. All 18 participants answered questions 4, 5, and 9 correct on both the pre and post-test. Question 4 asked: *PTSD may alter the fear-response areas of the brain, the amygdala, and the hippocampus*; question 5 asked, *Depression, anxiety, substance use, personality disorders and somatic symptom disorders are common comorbidities among people with PTSD*; and question 9 asked, *Attention to physical well-being, social support and the development of active coping mechanisms can help me adapt to stressful working conditions*. Fifteen participants answered question 1, and 17 participants answered question 8 correct from pre-post test. Question 1 asked, *Posttraumatic stress disorder only happens to someone after experiencing a major traumatic event*; and question 8 asked, *Risk factors risk factors for PTSD include a previous history of trauma, including childhood abuse or neglect*.

Participant's scores decreased on questions 6 and 10. Question 6 asked, *Treatment can be effective even if it begins years after the event occurs or symptoms begin.*

Seventeen participants answered correct on the pre-test whereas 16 participants answered correctly on the post-test. Question 10 asked, *Resilience is something a person is born with and cannot be learned.* Eighteen participants answered correct on the pre-test and 16 answered correct on the post-test.

Questions 2, 3, and 7 had significant increases in scores from pre-post test.

Question 2 asked, *Posttraumatic stress disorder diagnosis is made when symptoms are present for >3 months and are causing significant distress and impairment in functioning;* 3 participants answered correct on the pre-test and 10 on the post-test.

Question 3 asked, *SSRI's, specifically Sertraline and Paroxetine, are the only two FDA approved treatments for PTSD and recommended duration of treatment is at least 8 to 12 weeks;* 9 participants answered correct on the pre-test and 18 on the post-test. Question 7 asked, *Men are at higher risk for Secondary Traumatic Stress and PTSD;* 9 participants answered correct on the pre-test and 15 on the post-test.

The overall mean scores increased from 78.89% on the pre-test to 89.44% on the post-test, which indicates an overall increase of 10.55%. This indicates an overall increase in knowledge from pre-post test. Although there was an increase overall scores, when a paired t-test was conducted, the increase was not statistically significant. The null hypothesis was that there would be no significant increase from pre-test to post-test aggregate scores. The two-sample means are equal. The alternate hypothesis or goal-outcome was that there would have been an increase in mean score from pretest to post-



test. With a confidence interval of 0.05, with 9 degrees of freedom,  $t_{crit} = 1.833$  (Larson & Farber, 2015), the null hypothesis cannot be rejected (Appendix I).

## **Summary and Conclusions**

The purpose of this project was to determine if there was a change in nurses' knowledge regarding primary and secondary PTSD after an educational intervention.

A pre-test, post-test educational design was utilized to assess for an increase in nurses' knowledge. The participants consisted of 18 volunteers from a convenience sample of Registered Nurses working at Our Lady of Fatima Hospital. Organizational support was obtained, and exempt status was granted from CharterCare IRB. Approval was granted from the IRB at Rhode Island College.

A recorded PowerPoint presentation was created and included information aimed at increasing knowledge of primary PTSD and secondary PTSD in staff nurses, and strategies to help prevent PTSD following a traumatic event. The recorded PowerPoint was uploaded into the HealthStream online education portal, for registered nurses at Fatima Hospital. An email with an informational letter explaining the project was sent to registered nurses, through their CharterCare email. Reminder emails were sent 2 weeks later and again at 4 weeks due to a low number of participant responses. The informational letter in the email contained a link to the educational PowerPoint and tests and stated participation in the educational program was completely voluntary. Completion of the pre and post-tests was considered consent to participate in the project and participants were informed they may withdraw from the project at any time. The educational intervention was limited to 15 minutes. The electronic pre-test was taken immediately before and the post-test was taken immediately following the educational intervention.

Fifty percent of the participants had over 20 years of experience as a registered nurse and this could of affect the results as expert nurses have much more knowledge than novice nurses. These nurses may have been much more knowledgeable regarding PTSD.

It can be concluded that there was an overall increase in knowledge, which aligns with the purpose but was not statistically significant per t-test. There was no change in scores on questions 1, 4, 5, 8, and 9 from pre to post-test. These were *1. Post-traumatic stress only happens after experiencing a major traumatic event*. This was false as someone can have PTSD with repeated occupational exposure an also in the fact that what one person considers a major event may not affect another person to the same extent. *4. PTSD may alter the fear response areas of the brain, the amygdala, and the hippocampus*. This was true. *5. Depression, anxiety, substance abuse, personality disorders and somatic symptom disorders are common comorbidities among people with PTSD*. This was true. *8. Risk factors for PTSD include a previous history of trauma, including childhood abuse or neglect*. This was true. *9. Attention to well-being, social support, and the development of active coping mechanisms can help me adapt to stressful working conditions*. This was true. All 18 participants answered questions 4, 5, and 9 correct on both the pre and post-test. This could be because the sample participants were already knowledgeable regarding; information, that PTSD does not only happen to someone experiencing major traumatic event, that PTSD alters fear response areas of brain, the common co-morbidities of people with PTSD, and risk factors.

There was a slight decrease in questions 6 and 10. These were *6. Treatment can be effective even if it begins years after the event occurs*. This was true. *10. Resilience is*

*something a person is born with and cannot be learned.* This was false, as resilience can be improved. Looking back at the PowerPoint, it was noted that these talking points were not embedded in the slides although they were stated in the recording. This may have had a negative impact for visual learners.

There was an increase in knowledge from pre-test to post-test with questions 2, 3 and 7. These were 2. *PTSD diagnosis is made when symptoms are present for >3 months and are causing significant impairment in functioning.* This was false as diagnosis is made for PTSD at >1 month. 3. *SSRI's sertraline and paroxetine are the only FDA approved treatments for PTSD.* This was true. 7. *Men are at higher risk for secondary traumatic stress and PTSD.* This was false as women are generally at higher risk for secondary stress and PTSD.

The review of literature supports the need to increase awareness of primary and secondary PTSD in nurses. Prevention of symptoms or early detection of symptoms can help alleviate the physiological changes that may accompany PTSD. If we can prevent PTSD symptoms, then possibly there could be a decrease in suicide as well. Strategies to improve health and decrease controllable factors in metabolic syndromes as previously discussed can also help strengthen the lines of resistance and improve resilience.

Some limitations of this project were the small sample size. In addition, nurses also have multiple alerts in their email about HealthStream activities that are required and may not have wanted to participate in an elective education program.

This program was limited to education only. In the future, a needs assessment could determine if there is any interest in developing scope of the program further to include resilience training for nurses. With these programs, success could be measured

with a PTSD symptom scale or stress self-assessment scale, before and after stress-reducing interventions such as education in relaxation techniques, mindfulness, narrative expressive writing, or implementation of other support measures. In accordance with the Betty Neuman Systems Model, programs could include exercise, nutrition, and sleep hygiene techniques to support physical well-being which in turn supports resilience and to help decrease risk of metabolic syndrome.

### **Recommendations and Implications for Advanced Nursing Practice**

Americans have an 8.7% risk for the development of PTSD. Nurses are at elevated risk of developing secondary PTSD through occupational exposure and have been found have a higher suicide rate than the general population. The statistics in the literature review were dated from prior to the Covid-19 pandemic. It can be postulated that there will be an increase in the incidence of PTSD, as we move forward.

As Davidson et al. (2018) wrote in their discussion paper for the National Academy of Medicine, there remains a need for further research, including ways to mitigate secondary stress and burnout. Although statistics of risk factors are important, it is also important to be aware of symptoms and knowledge that secondary PTSD can happen to anyone and that there are available treatments. Advance practice nurses should be vigilant in watching for symptoms in peers as well as themselves.

Advance practice nurse education is based on the wellness model, which is a proactive model. In that respect Advance Practice Nurses (APRNs) should focus on prevention of disease. APRN's can be a change agent in developing programs and implementing supportive changes in their work environment. With knowledge, APRNs can be vigilant regarding symptoms, early identification of problems, and treatments to mitigate suffering from stress and PTSD. Advance Practice Nurses can also encourage organizations to practice universal precautions regarding PTSD, such as support for staff both preemptively through resilience training, and post-trauma support.

More research is needed to understand resilience factors, preventative treatment, and the most appropriate mechanism to disseminate and implement strategies to address PTSD. These measures would not only be better for staff but also employers. These actions could help address the cost of nurse turnover. According to the Robert Johnson

Wood Foundation 2009 report, the cost of replacing a registered nurse can range anywhere between \$22,000 to over \$64,000 dollars in hiring, training costs and use of replacement staff. Also, the loss of veteran nurses can leave healthcare systems with less experienced nurses, possibly leading to increased medical errors and less ideal outcomes (Robert Johnson Wood Foundation, 2009).

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## Appendix A

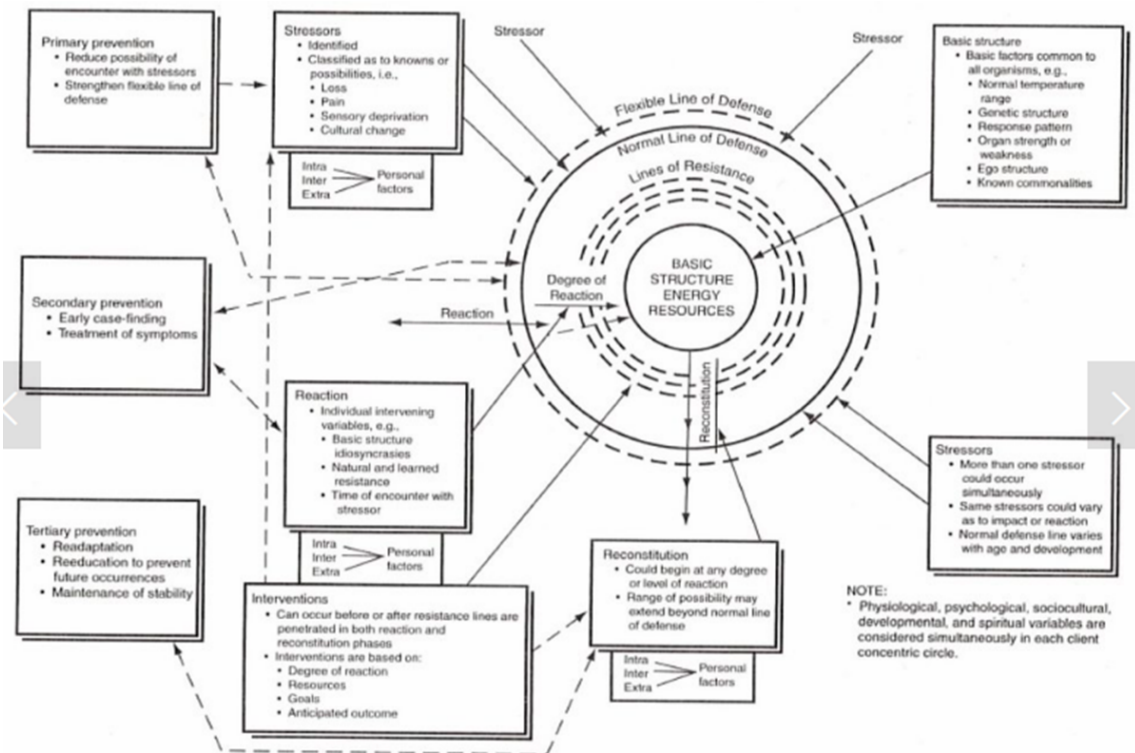


FIGURE 1-3. The Neuman Systems Model. (Original diagram copyright © 1970 by Betty Neuman.)

## Appendix B

### Logic Model Development Program Implementation Template – Exercise 1 & 2

RESOURCES	ACTIVITIES	OUTPUTS	SHORT- & LONG-TERM OUTCOMES	IMPACT
<i>In order to accomplish our set of activities we will need the following:</i>	<i>In order to address our problem or asset we will accomplish the following activities:</i>	<i>We expect that once accomplished these activities will produce the following evidence or service delivery:</i>	<i>We expect that if accomplished these activities will lead to the following changes in 1–3 then 4–6 years:</i>	<i>We expect that if accomplished these activities will lead to the following changes in 7–10 years:</i>
<p>Access to evidence-based research.</p> <p>Time/ availability for participants to take part in the program.</p> <p>Place: Workspace available for the presentation of the program that is conducive to learning.</p>	<p>Thorough review of literature to gather evidence-based data.</p> <p>Create educational materials.</p>	Education	<p>Short Term: Improved knowledge of PTSD, risk factors and symptomology, coping mechanisms and available resources.</p> <p>Long Term: Knowledge will empower nurses to prepare for traumatic stress, recognize symptoms, cope with traumatic stress, seek supportive services.</p>	<p>Perceived benefits of skills and coping mechanisms lead to a decrease in symptoms of PTSD in bedside nurses. The effect carries over to an improvement in the workplace environment.</p>

(Kellog Foundation, 2004).

## Appendix C



January 12, 2021

To Whom It May Concern:

I wish to fully endorse the project by Stephanie Connor to be completed at CharterCARE Our Lady of Fatima Hospital. The project title, "The Development of an Education Program for Registered Nurses on Post Traumatic Stress Disorder", addresses a very important issue especially in the current healthcare environment. I am happy to assist Stephanie in any way I can as she works toward completing her degree.

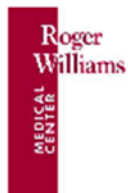
If you should have any questions or concerns related to the project, please feel free to contact me.

Best Regards,

Patricia Bibeault, Clinical Nurse Manager  
Our Lady of Fatima Hospital  
200 High Service Avenue  
North Providence, RI 02904  
Office: 401-456-3864  
Cell: 401-439-3378  
[pbibeault@chartercare.org](mailto:pbibeault@chartercare.org)



## Appendix D



### Human Research Review Committee Roger Williams Medical Center Notice of IRB Determination

FWA 00005452  
IORG 0000040  
IRB00000058

January 8, 2021

Stephanie Connor

Re: Development of an Educational Program for Registered Nurses on Post traumatic Stress Disorder

Administrative Review      Exemption Review      Review Date: January 8, 2021

Items Reviewed:

- Completed Submission form
- Protocol Document
- PowerPoint Slides

Based on the information provided in your submission and the following federal regulations: 45 CFR 46.104(d) (2)(i) your project is exempt from IRB review.

As principal investigator of this project, you are required by federal regulations to inform the HRRC of any proposed changes in your research that will affect human subjects. Changes must not be initiated until HRRC approval is received.

The Human Research Review Committee operates in compliance with the United States Department of Health and Human Services regulations 45 CFR Part 46, entitled Protection of Human Subjects (common rule). United States Food and Drug Administration as described in 21 CFR Parts 50 and 56, and The HIPAA Privacy Rule, 45 CFR Parts 160 and 164 as applicable.

CC: Karen Geremia, Director, Research Department

## Appendix E

NoReply@TOPAZTI.net  
Wed 1/13/2021 5:16 PM

To:

- Dame, Linda M.;
- Institutional Review Board - Rhode Island College

Greetings,

The proposal for the project referenced below has been DETERMINED NOT HUMAN SUBJECTS by the Institutional Review Board (IRB) BECAUSE IT IS A QUALITY IMPROVEMENT PROJECT.

Do not reply to this "RIC\_Elements" email address because it will not be received by the IRB. Send all correspondence to IRB@ric.edu.

Best Regards,

Emily Cook, Ph.D.  
Professor  
Chair, IRB  
Rhode Island College  
IRB@ric.edu

Project title: Development of an Educational Program for Registered Nurses on Post Traumatic Stress Disorder

#: 2021-2135

## Appendix F

### Informational Letter

My name is Stephanie Connor RN. I am a graduate student at Rhode Island College. I will be conducting a Master's project with principal investigator, Linda Dame. I will be conducting a quality improvement project called Development of an Educational Program for Registered Nurses on Post Traumatic Stress Disorder.

I am writing to invite you to participate in this brief educational program for nurses, on post-traumatic stress disorder. The purpose of this project is to determine if there is a change in nurses' knowledge regarding primary and secondary PTSD after an educational intervention. The goal of this project is to increase knowledge of PTSD and secondary PTSD in nurses.

You will be asked to participate in a brief educational PowerPoint through HealthStream. Your participation in this project will take approximately 15 minutes of your time. There will be pre-test, a recorded PowerPoint, and a post-test. I will be comparing pre-test and post-test scores.

Participation in this project is voluntary. If you choose to participate, you can access it by logging into to your HealthStream. Data from this project will be kept anonymous. None of the information collected will identify you personally. If you have any questions about this project, please feel free to contact me at [sconnor\\_2812@email.ric.edu](mailto:sconnor_2812@email.ric.edu) or the principal investigator of this project Linda Dame DNP, APRN, FNP-BC at [ldame@ric.edu](mailto:ldame@ric.edu).

Thank you for your time,

Stephanie Connor BSN, RN-BC  
Acute Care Nurse Practitioner Student  
Rhode Island College  
Graduate School of Nursing  
[Sconnor\\_2812@email.ric.edu](mailto:Sconnor_2812@email.ric.edu)

## Appendix G

### Pretest

Years as an RN

0-5years \_\_\_\_\_

6-10 years \_\_\_\_\_

11-15 years \_\_\_\_\_

16-20 years \_\_\_\_\_

> 20 years \_\_\_\_\_

1. Posttraumatic stress disorder only happens to someone after experiencing a major traumatic event.	true	false
2. Posttraumatic stress disorder diagnosis is made when symptoms are present for >3 months and are causing significant distress and impairment in functioning.	true	false
3. SSRI's, specifically Sertraline and Paroxetine, are the only two FDA approved treatments for PTSD. Recommended duration of treatment is at least 8 to 12 weeks.	true	false
4. PTSD may alter the fear-response areas of the brain, the amygdala, and the hippocampus.	true	false
5. Depression, anxiety, substance use, personality disorders and somatic symptom disorders are common comorbidities among people with PTSD.	true	false
6. Treatment can be effective even if it begins years after the event occurs or symptoms begin.	true	false
7. Men are at higher risk for Secondary Traumatic Stress and PTSD.	true	false
8. Risk factors for PTSD include a previous history of trauma, including childhood abuse or neglect.	true	false
9. Attention to physical well-being, social support and the development of active coping mechanisms can help me adapt to stressful working conditions.	true	false
10. Resilience is something a person is born with and cannot be learned.	true	false

## Posttest

1. Posttraumatic stress disorder only happens to someone after experiencing a major traumatic event. (Secondary PTSD is when someone experiences PTSD following hearing details of a loved one's trauma or through occupational exposure.)	true	false
2. Posttraumatic stress disorder diagnosis is made when symptoms are present for >3 months and are causing significant distress and impairment in functioning. (Symptoms must be present for >1month)	true	false
3. SSRI's, specifically Sertraline and Paroxetine, are the only two FDA approved treatments for PTSD. Recommended duration of treatment is at least 8 to 12 weeks.	true	false
4. PTSD can alter the fear-response areas of the brain, the amygdala, and the hippocampus.	true	false
5. Depression, anxiety, substance use, personality disorders and somatic symptom disorders are common comorbidities among people with PTSD.	true	false
6. Treatment can be effective even if it begins years after the event occurs or symptoms begin.	true	false
7. Men are at higher risk for Secondary Traumatic Stress and PTSD. (Women are at higher risk)	true	false
8. Risk factors for PTSD include a previous history of trauma, including childhood abuse or neglect.	true	false
9. Attention to physical well-being, social support and the development of active coping mechanisms can help me adapt to stressful working conditions.	true	false
10. Resilience is something a person is born with and cannot be learned. (Resilience can be improved with training.)	true	false

## Appendix H

### Pre-Post Test Results

Question	Pre-test correct response N	Pre-test correct response %	Post-test correct response N	Post-test correct response %
1. Posttraumatic stress disorder only happens to someone after experiencing a major traumatic event.	(False) N=15	83.33%	(False) N=15	83.33%
2. Posttraumatic stress disorder diagnosis is made when symptoms are present for >3 months and are causing significant distress and impairment in functioning.	(False) N=3	16.67%	(False) N=10	55.56%
3. SSRI's, specifically Sertraline and Paroxetine, are the only two FDA approved treatments for PTSD. Recommended duration of treatment is at least 8 to 12 weeks.	(True) N=9	50%	(True) N=18	100%
4. PTSD may alter the fear-response areas of the brain, the amygdala, and the hippocampus.	(True) N=18	100%	(True) N=18	100%
5. Depression, anxiety, substance use, personality disorders and somatic symptom disorders are common comorbidities among people with PTSD.	(True) N=18	100%	(True) N=18	100%
6. Treatment can be effective even if it begins years after the event occurs or symptoms begin.	(True) N=17	94.44%	(True) N=16	88.89%
7. Men are at higher risk for Secondary Traumatic Stress and PTSD.	(False) N=9	50%	(False) N=15	83.33%
8. Risk factors for PTSD include a previous history of trauma, including childhood abuse or neglect.	(True) N=17	94.44%	(True) N=17	94.44%
9. Attention to physical well-being, social support and the development of active coping mechanisms can help me adapt to stressful working conditions.	(True) N=18	100%	(True) N=18	100%
10. Resilience is something a person is born with and cannot be learned.	(false) N=18	100%	(false) N=16	88.89%
Overall Average		78.89%		89.44%

## Appendix I

### T-test

Question #	Pre-test	Post-test	D	D <sup>2</sup>
1	83.33	83.33	0	0
2	16.67	55.56	-38.89	1512.43
3	50	100	-50	2500
4	100	100	0	0
5	100	100	0	0
6	94.44	88.89	5.55	30.80
7	50	83.33	-33.33	1110.89
8	94.44	94.44	0	0
9	100	100	0	0
10	100	88.89	11.11	123.43
			$\Sigma = -105.67$	$\Sigma = 5277.55$

$$t_{\text{stat}} = \frac{\frac{\Sigma D}{N-1}}{\sqrt{\frac{\Sigma D^2 - (\Sigma D)^2}{N-1}}}$$

$$t_{\text{stat}} = -1.55$$